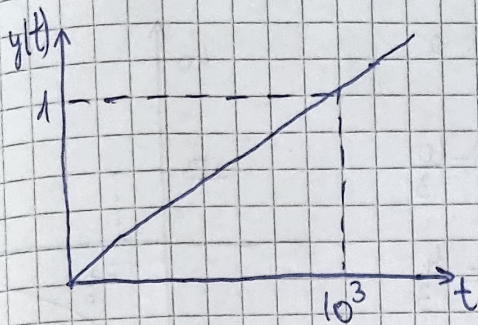


$$1) H(s) = \frac{1}{1000s}$$

$$y(t) = \mathcal{L}^{-1} \left\{ \frac{1}{1000s^2} \right\} = 10^{-3} \cdot \mathcal{L}^{-1} \left\{ \frac{1}{s^2} \right\} = 10^{-3} t$$



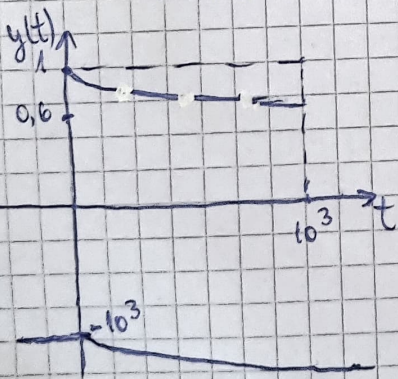
$$2) H(s) = \frac{1}{1000s+1}$$

$$y(t) = \mathcal{L}^{-1} \left\{ \frac{1}{1000s^2+s} \right\} = \mathcal{L}^{-1} \left\{ \frac{R_1}{1000s+1} + \frac{R_2}{s} \right\} = \mathcal{L}^{-1} \left\{ \frac{R_1}{s+10^{-3}} \right\} + \mathcal{L}^{-1} \left\{ \frac{R_2}{s} \right\}$$

$$R_1 = \lim_{s \rightarrow -10^{-3}} \frac{1}{s+10^{-3}} = 10^3$$

$$R_2 = \lim_{s \rightarrow 0} \frac{1}{s} = -10^3$$

$$y(t) = \mathcal{L}^{-1} \left\{ \frac{10^3}{s+10^{-3}} \right\} + \mathcal{L}^{-1} \left\{ \frac{-10^3}{s} \right\} = 10^{-3} \cdot 10^3 \cdot e^{-10^3 t} + (-10^3) = e^{-10^3 t} - 10^3$$



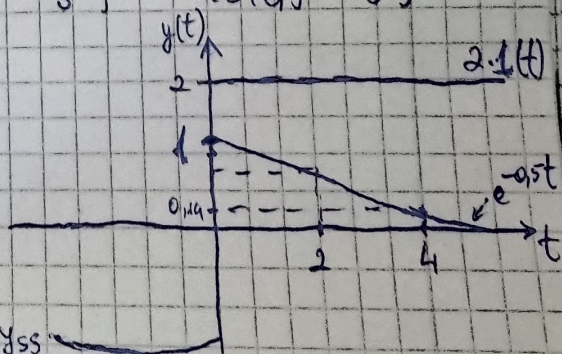
$$3) H(s) = \frac{3s+1}{s+0.5}$$

$$y(t) = \mathcal{L}^{-1} \left\{ \frac{3s+1}{s+0.5} \cdot \frac{1}{s} \right\} = \mathcal{L}^{-1} \left\{ \frac{R_1}{s+0.5} + \frac{R_2}{s} \right\} = \mathcal{L}^{-1} \left\{ \frac{1}{s+0.5} + \frac{2}{s} \right\} =$$

$$R_1 = \lim_{s \rightarrow -0.5} \frac{3s+1}{s} = -1$$

$$R_2 = \lim_{s \rightarrow 0} \frac{3s+1}{s+0.5} = 2$$

$$= \mathcal{L}^{-1} \left\{ \frac{1}{s+0.5} \right\} + \mathcal{L}^{-1} \left\{ \frac{2}{s} \right\} = e^{-0.5t} + 2 \cdot 1(t)$$



$$4) H(s) = \frac{20}{(s+5)(s+3)}$$

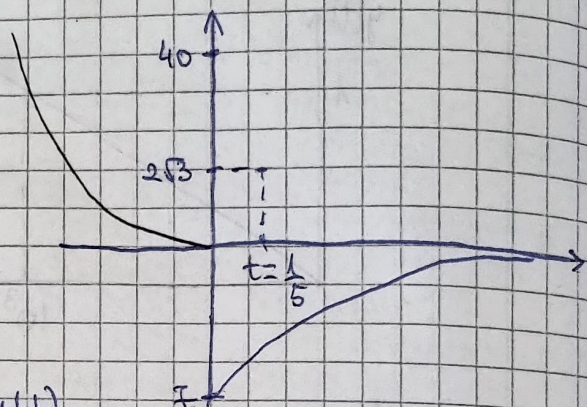
$$y(t) = \mathcal{L}^{-1} \left\{ \frac{20}{(s+5)(s+3)} \cdot \frac{1}{s} \right\} = 20 \mathcal{L}^{-1} \left\{ \frac{R_1}{s+5} + \frac{R_2}{s+3} + \frac{R_3}{s} \right\} = 20 \mathcal{L}^{-1} \left\{ \frac{2}{s+5} - \frac{10}{s+3} + \frac{4}{s} \right\}$$

$$R_1 = \lim_{s \rightarrow -5} \frac{20}{s(s+3)} = \frac{20}{-10} = -2$$

$$R_2 = \lim_{s \rightarrow -3} \frac{20}{s(s+5)} = \frac{20}{-6} = -\frac{10}{3}$$

$$R_3 = \lim_{s \rightarrow 0} \frac{20}{(s+5)(s+3)} = \frac{20}{15} = \frac{4}{3}$$

$$y(t) = 20 \cdot 2 \cdot e^{-5t} - \frac{200}{3} e^{-3t} + \frac{80}{3} \cdot \phi(t)$$



$$7) H(s) = \frac{16}{s^2 + 2s + 16}$$

$$y(t) = 16 \mathcal{L}^{-1} \left\{ \frac{1}{s} \cdot \frac{16}{s^2 + 2s + 16} \right\}$$

$$= 16 \mathcal{L}^{-1} \left\{ \frac{R_1}{s} + \frac{b_1 s + b_0}{s^2 + 2s + 16} \right\}$$